considering the difficulty of distinguishing the fainter displays, is regarded as establishing the trustworthy character of the record by the general accordance between the three independent observers. It appears, that, out of 215 favorable nights, 24 auroras were noted; and, if we may assume the same ratio to apply to the cloudy nights, about 41 auroral displays occurred during the twelve months.

These observations were undertaken to throw light upon the supposed connection between the number of solar spots and the frequency of auroras and of magnetic disturbances. They have now been continued long enough to give interest to the following summary, compiled from the annual astronomical orders. It will be noted that there is a marked correspondence between the epochs of maximum and minimum auroras, and of maximum and minimum solar spots, as given by Prof. Fritz of Zurich; viz., —

Epoch of maximum solar spots	1870.6
" minimum " "	1878.9
" maximum " "	1882.4

The column headed 'Average number of sun-spots' is derived from the observations of Prof. D. P. Todd, published by the U. S. signal-office.

SUMMARY OF AURORAL RECORDS FOR FOURTEEN YEARS.

Year.	Clear sky.		Cloudy sky.		Total for year.	Average No. of sun-spots.	Remarks.
	Nights.	Observed auroras.	Nights.	Probable auroras.			
1870	184	50	150	41	99	–	11 mos.
1871	211	60	154	44	104	–	
1872	234	60	132	34	94	–	
1873	214	54	151	38	92	–	
1874	190	18	175	17	35	–	
1875	189	14	176	13	27	–	
1876	195	9	171	8	17	–	
1877	191	7	174	6	13	2.6	Began
1878	185	2	180	2	4	2.2	June,
1879	204	9	161	7	16	2.0	1877.
1880	216	13	150	9	22	14.3	
1881	191	23	174	21	44	26.7	
1882	201	55	164	44	99	28.3	
1883	215	24	150	17	41	27.4	

RECENT PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Albany institute.

May 13. — Dr. James Hall gave a description of some forms of newly discovered fossil sponges of the family of Dictyospongidae. Fossil sponges begin in the paleozoic rocks, and continue upwards through the coal-measures. The divisions of the fossil sponges are by fours : that is, some had four marked longitudinal lines or ridges; others, eight, and twelve, and sixteen. The most remarkable form was one with thirty-two radiating lines connected by concentric rings resembling a spider's web. Of this there are only two specimens in the world, yet discovered; and these are in the New-York state museum. Until within a few years the fossil sponges had been undetermined, and many had regarded them as the remains of true vegetable forms of life. Europe, up to 1883, had produced but five species of fossil sponges of the family Dictyospongidae. From New-York state, Professor Hall has secured thirty-five species, thirty-one of which he has been the first to discover and to describe. A notice of the family Dictyospongidae was read at the meeting of the American association for the advancement of science, in Montreal in 1882, and plates from the thirty-fifth Report of the New-York state museum of natural history were exhibited. The paper at present in press gives descriptions of the genera Cyathophycus, Dictyophyton (= Hydnoceras Conr. 1842), Ectenodictya, Lyriodictya, Thamnodictya, Phragmodictya, Cleodictya, Physospongia, and Uphantaenia, with numerous illustrations.

Academy of natural sciences, Philadelphia.

May 6. — Professor Joseph Leidy directed attention to some little tape-worms which had recently been submitted to his examination. They were expelled, after the use of santonin, from a child of three years. The specimens, consisting of a dozen fragments, appear to be portions of three worms, which probably reached a length of from twelve to fifteen inches. Unfortunately the head is lost. The joints, or proglottides, are several times broader than long. The eggs occupy a simple uterus, defined by the walls of the joints, and not divided into pouches diverging laterally from the main stem, as in most Taeniae. A singular feature of the worm is the interruption of the series of ripe joints, here and there, by one or more completely sterile ones. The generative apertures open in the usual way on the lateral margin of one side. The mature eggs are spherical, measure 0.072 of a millimetre diameter, and contain fully developed, six-hooked embryos. While differing greatly from the ordinary tape-worms infesting man, they approximate nearly the description of Taenia flavopunctata, and probably pertain to this species. This has been but once previously observed, and was described in 1858 by Dr. Weinland, from specimens in the museum of the Medical improvement society of Boston. These also were discharged by a child. It is probable that the worm is more common than would be supposed from the instances of its observation, and has perhaps escaped notice from its small size, and from the general ignorance of the distinction, not only of this, but of the ordinary species of tape-worms. —— Prof. J. T. Rothrock referred to the structure of the common violet, and remarked that he had observed that in the flower, the so-called path-finders, or lines of the petals leading to the ovaries, are much more conspicuous on the lower and side petals than on the others, thus rendering them of most use to insects, which are supposed to be guided by them to the ovaries.

May 13. — Professor Joseph Leidy exhibited specimens of a curious parasite (Pentastomum proboscideum), found in the lung of a large rattlesnake (Crotalus adamanteus) from Florida. They are cylindrical, incurved, annulated, largest at the head, tapering behind, becoming again larger, and rounded at the end, and terminating ventrally in a short, conical point. They vary from nine lines to thirty-one lines in length, and from one and a half to three lines in width at the head. Although these curious creatures, in their mature stage, are cylindrical, worm-like, limbless bodies, they are allied, by their structure and embryonic peculiarities, to the Arachnida, or spiders. —— Mr. Edward Potts announced the discovery in Harvey's Lake, near Wilkesbarre, of vast colonies of a species of the beautiful polyp, Cristatella. He had not been able to determine whether or not it belongs to one of the three described species of the genus. They may prove to be distinct, although it is not improbable that all the species may hereafter be considered as one. The specimens were collected from the smooth, inclined surface of logs, and from the branches and twigs of submerged trees. Colonies had since been formed on the sides of a collecting-jar, each statoblast having developed into from three to eight polyps. The colonies are not circular, but have a persistent appendage which contains none of the polypiferous cells. Supposing the form to be new, he proposed for it the name Cristatella lacustris.

Colorado scientific society.

May 5. — Messrs. W. F. Hillebrand and Richard Pearce made a preliminary communication in regard to an interesting group of minerals recently found in Utah, some of them being new to the United States. The minerals found are, enargite and the secondary hydrous arseniates, olivenite, and conichalcite (Dana's System of min., p. 565), with two amorphous substances corresponding, apparently, to pitticite and chenevixite. The olivenite occurs in small, distinct crystals; the conichalcite, in form similar to that from the only locality previously known, in Spain, while its chemical composition is also very near to that of the original mineral, a small amount of copper being replaced by zinc. Jarosite, turgite, and one or two as yet undetermined species, occur sparingly with the above. Mr. Pearce also exhibited pseudo-malachite associated with hübnerite from near Phillipsburg, in Montana.

Society of arts of the Massachusetts institute of technology.

April 24. — Prof. Charles R. Cross gave a lecture on 'The determination, history, and present standards of musical pitch.' After referring to the use of the sonometer for determining the relative number of vibrations of any two notes, Professor Cross gave a description of the methods of determining the absolute number of vibrations of any fork, giving an account of König's researches (*Amer. journ. otology*, October, 1880), and explaining the use of Scheibler's tonometer. The only good standard was stated to be the tuning-fork, which varies its rate less than $\frac{1}{9000}$ per degree (Centigrade) of change in temperature; while the organ-pipe and the oboe, sometimes used as standards, vary much more with changes of temperature. The history of pitch was discussed, and tables given showing the change in the standards from time to time. The principal change had been a gradual rise of the standard. Some measurements made by Professor Cross in 1880 had given results, of which the following is an abstract: —

	Number of vibrations, C_3.
Ritchie, copy of Chickering's standard	269
Mason & Hamlin, French pitch	259.1
Hook & Hastings, old flat organ-pitch	264.6
Organ in Church of Immaculate Conception, Boston	266.7
Chickering's standard fork	268.5
Smith American organ company	267.2
New-England organ company	268.2
H. F. Miller pianos	268.9
Hook & Hastings' standard	270
Weber pianos	270.3
Thomas's pitch, 1879	271.1
Music-Hall organ	271.2
Steinway's pitch	272.2
Highest New-York pitch	273.9

The standard used by the Boston symphony orchestra in 1882–83 was an A-fork of 448 double vibrations; that used in 1883–84 was a French A of 435 vibrations. The standard French pitch of the New-England conservatory of music is a middle C, a *true* sixth below the normal A, hence of 261 vibrations. Owing to the difference between the true and tempered sixths, the C-fork used with the orchestra which has A for its standard does not agree with this. Chickering and Miller have had C standard forks made which are a *tempered* sixth below the French A, making 258.7 vibrations, and which could therefore be used with the orchestra which has A for a standard. Thomas's present pitch is an A a little sharper than the French A. Comparing the highest New-York pitch given above with the standard in Handel's time, when the C-fork had 249.6 vibrations, the difficulty of singing some old music is readily understood. —— Mr. A. P. Browne explained the Deerfoot safety milk-can, by which the introduction of any adulterating substance into the can is rendered impossible, while the thorough mixing of the milk and cream is insured every time any milk is drawn out.

NOTES AND NEWS.

SEVERAL members of the New-York legislature, from the western part of the state, a year ago called the attention of their state board of health to the necessity of draining certain large, swampy, and miasmatic lands that lie in a shallow trough on the back of the hard Niagara limestone between Rochester and Niagara. In response to their memorial, Mr. Gardiner, director of the state survey, was requested by the board of health to make an accurate topographical map of the district, and to report upon a plan by which it could be drained; and accordingly sur-